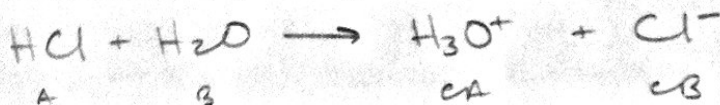


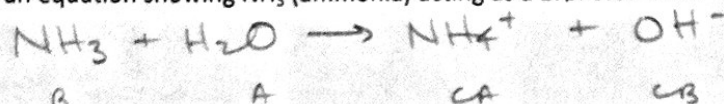
T08D04 - Brønsted-Lowry v Arrhenius Acids & Conjugates

Name ILEY

1. Write an equation showing HCl acting as a Brønsted acid.



* Brønsted acids donate a proton

Write an equation showing NH₃ (ammonia) acting as a Brønsted base.

* Brønsted bases accept a proton

Why is HCl considered an Arrhenius acid but ammonia not considered an Arrhenius base?

HCl can donate an H⁺ ion, whereas NH₃ cannot directly accept an OH⁻ ion.

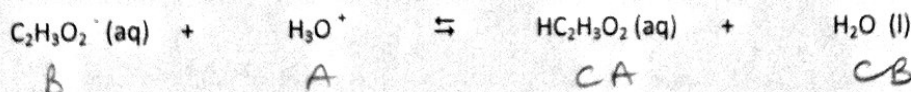
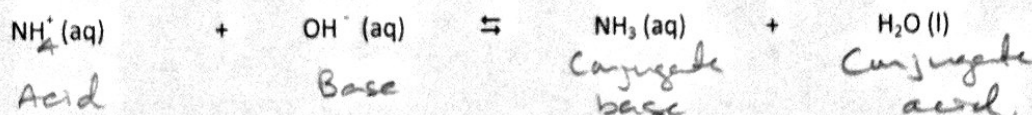
2. Why do both theories (Arrhenius and Brønsted) consider NaOH to be a base?

NaOH can donate an OH⁻ ion, therefore it's an Arrhenius base. It can also accept a proton, becoming H₂O and Na⁺.Why does the Brønsted theory consider the carbonate ion, CO₃²⁻, to be a base, while the Arrhenius theory does not?CO₃²⁻ can accept protons, therefore it's a Brønsted base (HCO₃⁻). H₂CO₃²⁻ does not have an OH⁻ in its formula to donate.

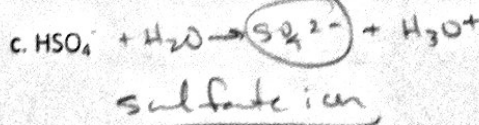
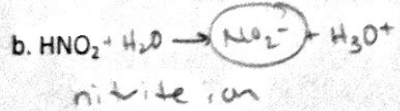
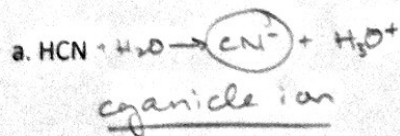
3. What is a conjugate acid-base pair?

An acid and its conjugate (produced) base.
A base and its conjugate (produced) acid.

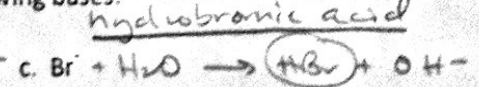
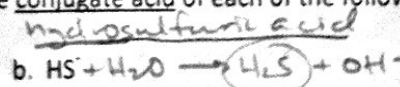
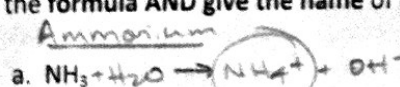
4. In the following equations label the Reactants as Brønsted conjugate acid/base pairs:



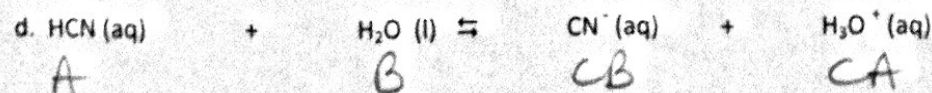
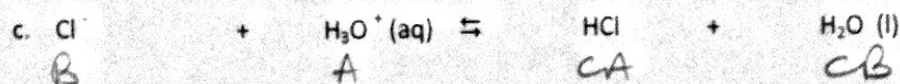
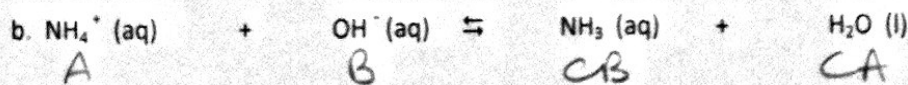
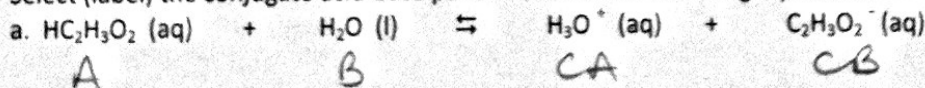
5. Write the formula AND give the name of the conjugate base of each of the following acids:



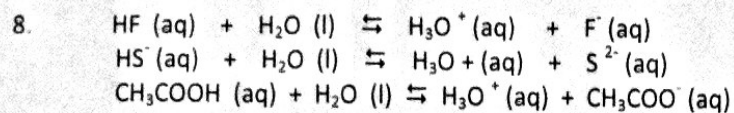
6. Write the formula AND give the name of the conjugate acid of each of the following bases:



7. Select (label) the conjugate acid-base pairs in each of the following equations:



Several acids are listed below with their respective equilibrium constants.



$$K_a = 7.2 \times 10^{-4}$$

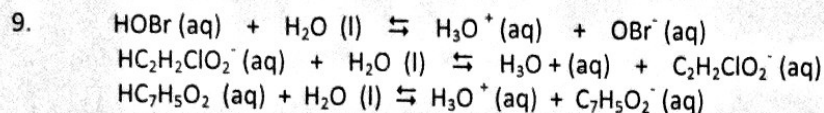
$$K_a = 1.3 \times 10^{-13}$$

$$K_a = 1.8 \times 10^{-5}$$

large K_a = stronger acid

- a. Which is the strongest acid? HF
b. Which is the weakest acid? HS⁻
c. Which acid has the **weakest** conjugate base? HF
d. Which acid has the **strongest** conjugate base? HS⁻

strong acid \rightarrow weak conj. base
strong base \rightarrow weak conj. acid
etc.



$$K_a = 2 \times 10^{-9}$$

$$K_a = 1.35 \times 10^{-3}$$

$$K_a = 6.4 \times 10^{-5}$$

- a. Which is the strongest acid? HC₂H₂ClO₂
b. Which is the weakest acid? HOBr
c. What is the conjugate base of H₃O⁺? H₂O
d. Which acid has the **weakest** conjugate base? HC₂H₂ClO₂
e. Which acid has the **strongest** conjugate base? HOBr